



General syllabus for doctoral studies in environmental science with a doctoral degree as final goal

Scope: 240 credits

Degree: Doctoral degree

Level: Third-cycle level

Established by: Syllabus adopted by the Faculty Board of Science and Technology 2025-10-20

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Responsible body: Faculty of Science and Technology

This document has been translated from Swedish into English. If the English version differs from the original, the Swedish version takes precedence.

1. Subject description and delimitation

Environmental science is the systematic and interdisciplinary (physical, chemical and biological) study of human-environment interaction, which includes human effects on the environment and natural environmental effects on humans. In particular, this research area focuses on the study of environmental problems, such as their causes and effects, which are central to understanding and achieving sustainable development.

PhD students in Environmental Science are expected to have acquired good general expertise in the subject and deep knowledge in their specific area of specialisation. The latter is demonstrated by the ability to conduct research that makes significant contributions to the field as described above.

2. Objectives of the education

2.1 Description of the programme at the current level

The programme is at third-cycle level. The objectives for third-cycle programmes are set out in the Higher Education Act, Chapter 1. 9 a §.

2.2 National objectives for the degree

The national objectives for the degree can be found in Appendix 2 of the Higher Education Ordinance.

The objectives for the doctoral degree in environmental science are defined in the Higher Education Ordinance, Chapter 6. 4 and 5 (see page 5), where the terms *research field* and *defined part of the research field* are interpreted as environmental science in the sense above, and as the doctoral student's specialised area within this subject. The objectives of the Higher Education Ordinance are supplemented with a gender equality and equal opportunities perspective that is integrated into the content and design of the programme, and gives the doctoral student insight into how the maintenance of inequalities through traditional structures can be counteracted.



3. Entry requirements and prerequisites

To be admitted to doctoral education, the applicant must meet the general entry requirements and the specific entry requirements established by the Faculty Board of Science and Technology, and be deemed to have the overall ability required to benefit from the education (Higher Education Ordinance, Chapter 7, Section 35).

General entry requirements

To fulfil the general entry requirements, the applicant must have qualifications equivalent to either a completed degree at advanced level (second-cycle), or completed course requirements of at least 240 ECTS, including at least 60 ECTS at advanced level, or has otherwise acquired essentially equivalent knowledge within or outside Sweden. The faculty board may, in the case of a specific applicant, consent to an exemption from the general entry requirements if there are special reasons to do so. (Higher Education Ordinance Chapter 7, Section 39)

Specific entry requirements

In order to fulfil the specific entry requirements for admission to doctoral studies in environmental science, the applicant must have passed courses in a basic higher education subject relevant to environmental science of at least 120 credits. At least one course at advanced level in a subject that is central to the doctoral student's planned specialisation must be included, as well as an independent project (degree project) with a relevant specialisation of at least 15 credits.

If there are special reasons, for example a strong interdisciplinary focus of the planned research work, it may be permitted to replace up to 30 of these 120 credits with courses in another relevant subject area.

The requirements for prior knowledge as described above are also considered to be met by those who have otherwise acquired essentially equivalent knowledge.

4. Selection

Selection among applicants who meet the entry requirements will be made with consideration of their ability to benefit from doctoral education, and is based on the following assessment criteria:

- previous study results
- specific merits in the proposed field of research
- personal suitability

However, applicants must not be given preference over other applicants in the selection process solely based on the assessment that the applicant can receive accreditation for previous education or professional activities. (HF Chapter 7, Section 41).

Decisions regarding admission to studies at doctoral level concluding in a doctoral degree are made in accordance with Umeå University's delegation regulations.



5. Content and structure

5.1 General information

An individual study plan shall be drawn up for each doctoral student, specifying funding, supervision, courses, thesis work, etc. The programme shall comprise 240 credits for a doctoral degree. A doctoral student who has been admitted to a doctoral programme with a doctoral degree as the final goal may, if the doctoral student so wishes, complete a licentiate degree as an intermediary goal (120 credits).

Doctoral education leading to a doctoral degree comprises four years of net study time and consists of a course component of 60 credits and a doctoral thesis of 180 credits.

5.2 Content

In addition to in-depth knowledge of environmental science, students will also practise critical and analytical thinking. During the programme, students solve problems independently and are prepared for a career in academia, business or the public sector. The programme has a very international character. Doctoral students often participate in international collaborations and have to present their research results in international contexts.

5.2.1 Courses

The 60 credits of coursework required for the doctoral degree comprise a set of fixed, compulsory courses and a variable number of courses determined individually according to the needs of the doctoral student. The compulsory courses focus on generic skills, provide an overview of the scientific activity and include gender and equality issues as integral parts. Depending on the specialisation and the prior knowledge of the doctoral student, the admission decision may also specify additional compulsory course requirements if deemed necessary to ensure that the doctoral student achieves a good overall subject matter expertise and in-depth knowledge in their specialised field.

The following courses are compulsory for all PhD students in Environmental science:

Faculty-wide courses developing generic skills (11 credits):

- Introductory course for PhD students at the Faculty of Science and Technology, 1 credit
- Oral presentation, 1 credit
- Scientific Writing, 5 credits
- Science, ethics and society, 4 credits

Courses at department level that develop subject competence (24 credits):

- Introductory course for PhD students at the Department of Environmental science, Environment and Earth Sciences (1 credit)
- Introductory thesis (9 credits)
- Literature courses (6 credits)
- Attendance and participation in seminars (8 credits)

Elective courses (25 credits):

These courses are chosen by the doctoral student in consultation with the supervisor and examiner and can be highly customised according to the doctoral student's interest and field of study. Elective courses may include additional literature courses and other courses offered by the department or other relevant departments. Courses that occur in other subject areas and that are of value to the doctoral programme in environmental science may be included to some extent. This applies in particular to certain courses in statistics, mathematics, computing, genetics, molecular



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biology, microbiology, systematics, environmental science, environmental science and chemistry, but also to certain courses in engineering, social sciences, pedagogy and humanities.

5.2.2 Doctoral thesis

The doctoral thesis comprises 180 credits. The doctoral thesis shall be written either as a single, coherent scientific work (monograph thesis) or as a compilation of scientific papers with an introduction, summary and discussion of these, including a description of the authors' contribution to each paper (compilation thesis).

The doctoral thesis must be defended orally at a public defence. It is assessed with one of the grades pass or fail. The grading shall take into account the content of the thesis and its defence.

6. Examination

A doctoral degree is awarded after the doctoral student has completed a doctoral programme of 240 higher education credits in environmental science and has received a passing grade in the examinations included in the programme and has written and defended a doctoral thesis at a public defence, which has been approved by the examining committee. Degree certificates are issued upon application to the Student Centre/Degrees.

7. Other instructions

The provisions that apply in respect of doctoral studies can be found in:

- The Higher Education Ordinance: Chapter 5 Employment of doctoral students, Chapter 6 Courses and study programmes, and Chapter 7 Admission to courses and study programmes, Annex 2 Qualifications ordinance.
- Admission regulations for doctoral education at Umeå University.
- Local degree ordinance at Umeå University.
- Rules for doctoral education at Umeå University.
- Handbook for doctoral studies at the Faculty of Science and Technology at Umeå University.



National goals for the degree

(HF 6 chapter, 4 and 5 §)

Knowledge and understanding

For a doctoral degree, the doctoral student shall

- demonstrate broad knowledge and a systematic understanding of the research field as well as deep and up-to-date specialised knowledge in a defined part of the research field, and
- demonstrate familiarity with scientific methodology in general and with the methods of the specific research area in particular.

Skills and abilities

For a doctoral degree, the doctoral student shall

- demonstrate the ability to scientifically analyse and synthesise and to independently critically examine and assess new and complex phenomena, issues and situations,
- demonstrate the ability to identify and formulate questions critically, independently, creatively and with scientific rigour, and to plan and use appropriate methods to carry out research and other qualified tasks within given time frames and to review and evaluate such work,
- demonstrate, through a thesis, the ability to make a significant contribution to the development of knowledge through their own research,
- demonstrate the ability to present and discuss research and research results with authority in both national and international contexts, orally and in writing, in dialogue with the scientific community and society in general,
- demonstrate the ability to identify the need for further knowledge, and
- demonstrate the ability to contribute to the development of society and to support the learning of others, both in research and education and in other qualified professional contexts.

Judgement and approach

For a doctoral degree, the doctoral student shall

- demonstrate intellectual independence and scientific integrity as well as the ability to make ethical judgements, and
- demonstrate in-depth insight into the possibilities and limitations of science, its role in society and people's responsibility for how it is used.